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l6 and alum	27

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WEST[Generate Collection](#)**Search Results - Record(s) 1 through 10 of 30 returned.**☐ 1. Document ID: US 6231864 B1

L7: Entry 1 of 30

File: USPT

May 15, 2001

US-PAT-NO: 6231864

DOCUMENT-IDENTIFIER: US 6231864 B1

TITLE: Strategically modified hepatitis B core proteins and their derivatives

DATE-ISSUED: May 15, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Birkett; Ashley J.	Solana Beach	CA	N/A	N/A

US-CL-CURRENT: 424/189.1; 424/192.1, 424/194.1, 424/196.11, 424/201.1, 424/202.1,
424/227.1, 530/350, 530/402, 530/403

Full	Title	Citation	Front	Review	Classification	Date	Reference	Claims	KWC	Draw Desc	Image
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☐ 2. Document ID: US 6211343 B1

L7: Entry 2 of 30

File: USPT

Apr 3, 2001

US-PAT-NO: 6211343

DOCUMENT-IDENTIFIER: US 6211343 B1

TITLE: Lactoferrin receptor protein

DATE-ISSUED: April 3, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Schryvers; Anthony B.	Calgary	N/A	N/A	CAX
Bonnah; Robert A.	Calgary	N/A	N/A	CAX

US-CL-CURRENT: 530/412; 424/249.1, 424/250.1, 530/350, 530/413

Full	Title	Citation	Front	Review	Classification	Date	Reference	Claims	KWC	Draw Desc	Image
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☐ 3. Document ID: US 6190668 B1

L7: Entry 3 of 30

File: USPT

Feb 20, 2001

US-PAT-NO: 6190668

DOCUMENT-IDENTIFIER: US 6190668 B1

TITLE: Transferrin receptor protein of moraxella

DATE-ISSUED: February 20, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Yang; Yan-Ping	Willowdale	N/A	N/A	CAX
Myers; Lisa E.	Guelph	N/A	N/A	CAX
Harkness; Robin E.	Willowdale	N/A	N/A	CAX
Klein; Michel H.	Willowdale	N/A	N/A	CAX

US-CL-CURRENT: 424/251.1; 435/7.1, 435/7.8, 435/70.2, 530/387.1, 530/412, 530/417

Full	Title	Citation	Front	Review	Classification	Date	Reference	Claims	KWIC	Draw Desc	Image
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☐ 4. Document ID: US 6184371 B1

L7: Entry 4 of 30

File: USPT

Feb 6, 2001

US-PAT-NO: 6184371

DOCUMENT-IDENTIFIER: US 6184371 B1

TITLE: Lactoferrin receptor genes of Moraxella

DATE-ISSUED: February 6, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Loosmore; Sheena M.	Aurora	N/A	N/A	CAX
Du; Run-Pan	Thornhill	N/A	N/A	CAX
Wang; Quijun	Thornhill	N/A	N/A	CAX
Yang; Yan-Ping	Willowdale	N/A	N/A	CAX
Klein; Michel H.	Willowdale	N/A	N/A	CAX

US-CL-CURRENT: 536/23.7; 424/200.1, 424/251.1, 435/252.3, 435/320.1, 435/69.1, 435/69.3, 435/69.7, 536/23.1, 536/24.3, 536/24.32

Full	Title	Citation	Front	Review	Classification	Date	Reference	KWIC	Draw Desc	Image
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☐ 5. Document ID: US 6153580 A

L7: Entry 5 of 30

File: USPT

Nov 28, 2000

US-PAT-NO: 6153580

DOCUMENT-IDENTIFIER: US 6153580 A

TITLE: Analog of haemophilus Hin47 with reduced protease activity

DATE-ISSUED: November 28, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Loosmore; Sheena M.	Aurora, Ontario	N/A	N/A	CAX
Yang; Yan-Ping	Willowdale, Ontario	N/A	N/A	CAX
Chong; Pele	Richmond Hill, Ontario	N/A	N/A	CAX
Oomen; Raymond P.	Schomberg, Ontario	N/A	N/A	CAX
Klein; Michel H.	Willowdale, Ontario	N/A	N/A	CAX

US-CL-CURRENT: 514/2; 435/220, 514/12

Full	Title	Citation	Front	Review	Classification	Date	Reference
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KWIC	Draw Desc	Image
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☐ 6. Document ID: US 6147057 A

L7: Entry 6 of 30

File: USPT

Nov 14, 2000

US-PAT-NO: 6147057

DOCUMENT-IDENTIFIER: US 6147057 A

TITLE: Analog of Haemophilus Hin47 with reduced protease activity

DATE-ISSUED: November 14, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Loosmore; Sheena M.	Aurora	N/A	N/A	CAX
Yang; Yan-Ping	Willowdale	N/A	N/A	CAX
Chong; Pele	Richmond Hill	N/A	N/A	CAX
Oomen; Raymond P.	Schomberg	N/A	N/A	CAX
Klein; Michel H.	Willowdale	N/A	N/A	CAX

US-CL-CURRENT: 514/44; 424/256.1, 536/23.7

Full	Title	Citation	Front	Review	Classification	Date	Reference
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KWIC	Draw Desc	Image
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☐ 7. Document ID: US 6121427 A

L7: Entry 7 of 30

File: USPT

Sep 19, 2000

US-PAT-NO: 6121427
DOCUMENT-IDENTIFIER: US 6121427 A

TITLE: Major outer membrane protein CD of branhamella

DATE-ISSUED: September 19, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Yang; Yan-Ping	Willowdale	N/A	N/A	CAX
Harkness; Robin Edmond	Willowdale	N/A	N/A	CAX
Myers; Lisa Elizabeth	Guelph	N/A	N/A	CAX
McGuinness; Ursula	Richmond Hill	N/A	N/A	CAX
Klein; Michel Henri	Willowdale	N/A	N/A	CAX

US-CL-CURRENT: 530/412; 424/184.1, 424/251.1, 530/413, 530/414

Full	Title	Citation	Front	Review	Classification	Date	Reference
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KWIC	Draw Desc	Image
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☐ 8. Document ID: US 6114125 A

L7: Entry 8 of 30

File: USPT

Sep 5, 2000

US-PAT-NO: 6114125
DOCUMENT-IDENTIFIER: US 6114125 A

TITLE: Analog of Haemophilus Hin47 with reduced protease activity

DATE-ISSUED: September 5, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Loosmore; Sheena M.	Aurora	N/A	N/A	CAX
Yang; Yan-Ping	Willowdale	N/A	N/A	CAX
Chong; Pele	Richmond Hill	N/A	N/A	CAX
Oomen; Raymond P.	Schomberg	N/A	N/A	CAX
Klein; Michel H.	Willowdale	N/A	N/A	CAX

US-CL-CURRENT: 435/7.1; 435/7.32

Full	Title	Citation	Front	Review	Classification	Date	Reference
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KWIC	Draw Desc	Image
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☐ 9. Document ID: US 6090576 A

L7: Entry 9 of 30

File: USPT

Jul 18, 2000

US-PAT-NO: 6090576
DOCUMENT-IDENTIFIER: US 6090576 A

TITLE: DNA encoding a transferrin receptor of Moraxella

DATE-ISSUED: July 18, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Myers; Lisa E.	Guelph	N/A	N/A	CAX
Schryvers; Anthony B.	Calgary	N/A	N/A	CAX
Harkness; Robin E.	Willowdale	N/A	N/A	CAX
Loosmore; Sheena M.	Aurora	N/A	N/A	CAX
Du; Run-Pan	Thornhill	N/A	N/A	CAX
Yang; Yan-Ping	Willowdale	N/A	N/A	CAX
Klein; Michel H.	Willowdale	N/A	N/A	CAX

US-CL-CURRENT: 435/69.1; 435/252.3, 435/320.1, 435/325, 435/71.1, 536/23.1, 536/23.7,
536/24.3

Full	Title	Citation	Front	Review	Classification	Date	Reference
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KWIC	Draw Desc	Image
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☐ 10. Document ID: US 6048539 A

L7: Entry 10 of 30

File: USPT

Apr 11, 2000

US-PAT-NO: 6048539
DOCUMENT-IDENTIFIER: US 6048539 A

TITLE: Lactoferrin receptor protein

DATE-ISSUED: April 11, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Schryvers; Anthony B.	Calgary	N/A	N/A	CAX
Bonnah; Robert A.	Calgary	N/A	N/A	CAX

US-CL-CURRENT: 424/249.1; 424/250.1, 424/251.1, 530/350

Full	Title	Citation	Front	Review	Classification	Date	Reference
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KWIC	Draw Desc	Image
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WEST[Generate Collection](#)**Search Results - Record(s) 11 through 20 of 30 returned.**☐ 11. Document ID: US 6025342 A

L7: Entry 11 of 30

File: USPT

Feb 15, 2000

US-PAT-NO: 6025342

DOCUMENT-IDENTIFIER: US 6025342 A

TITLE: Analog of Haemophilus Hin47 with reduced protease activity

DATE-ISSUED: February 15, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Loosmore; Sheena M.	Aurora	N/A	N/A	CAX
Yang; Yan-Ping	Willowdale	N/A	N/A	CAX
Chong; Pele	Richmond Hill	N/A	N/A	CAX
Oomen; Raymond P.	Tottenham	N/A	N/A	CAX
Klein; Michel H.	Willowdale	N/A	N/A	CAX

US-CL-CURRENT: 514/44; 424/93.1, 435/220, 435/252.3, 435/320.1, 435/325, 536/23.2, 536/23.7[Full](#) | [Title](#) | [Citation](#) | [Front](#) | [Review](#) | [Classification](#) | [Date](#) | [Reference](#)[KWIC](#) | [Draw Desc](#) | [Image](#)☐ 12. Document ID: US 6020183 A

L7: Entry 12 of 30

File: USPT

Feb 1, 2000

US-PAT-NO: 6020183

DOCUMENT-IDENTIFIER: US 6020183 A

TITLE: Analog of haemophilus Hin47 with reduced protease activity

DATE-ISSUED: February 1, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Loosmore; Sheena M.	Aurora	N/A	N/A	CAX
Yang; Yan-Ping	Willowdale	N/A	N/A	CAX
Chong; Pele	Richmond Hill	N/A	N/A	CAX
Oomen; Raymond P.	Tottenham	N/A	N/A	CAX
Klein; Michel H.	Willowdale	N/A	N/A	CAX

US-CL-CURRENT: 435/252.3; 424/197.11, 424/256.1, 424/94.63, 435/220, 435/252.1, 435/252.33, 435/69.1, 435/69.3, 435/7.1

Full	Title	Citation	Front	Review	Classification	Date	Reference
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KWIC	Draw Desc	Image
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☐ 13. Document ID: US 6004562 A

L7: Entry 13 of 30

File: USPT

Dec 21, 1999

US-PAT-NO: 6004562

DOCUMENT-IDENTIFIER: US 6004562 A

TITLE: Outer membrane protein B1 of Moraxella catarrhalis

DATE-ISSUED: December 21, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Campagnari; Anthony A.	Hamburg	NY	N/A	N/A

US-CL-CURRENT: 424/251.1; 424/184.1, 424/234.1

Full	Title	Citation	Front	Review	Classification	Date	Reference
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KWIC	Draw Desc	Image
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☐ 14. Document ID: US 5993826 A

L7: Entry 14 of 30

File: USPT

Nov 30, 1999

US-PAT-NO: 5993826

DOCUMENT-IDENTIFIER: US 5993826 A

TITLE: Methods and compositions relating to useful antigens of moraxella catarrhalis

DATE-ISSUED: November 30, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Hansen; Eric J.	Plano	TX	N/A	N/A
Helminen; Meria E.	Helsinki	N/A	N/A	FIN
Maciver; Isobel	Dallas	TX	N/A	N/A

US-CL-CURRENT: 424/251.1; 424/184.1, 435/69.1, 435/69.3, 530/350, 530/388.1, 530/388.2

Full	Title	Citation	Front	Review	Classification	Date	Reference
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KWIC	Draw Desc	Image
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☐ 15. Document ID: US 5981213 A

L7: Entry 15 of 30

File: USPT

Nov 9, 1999

US-PAT-NO: 5981213
DOCUMENT-IDENTIFIER: US 5981213 A

TITLE: Methods and compositions relating to useful antigens of moraxella catarrhalis

DATE-ISSUED: November 9, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Hansen; Eric J.	Plano	TX	N/A	N/A
Helminen; Merja E.	Helsinki	N/A	N/A	FIN
Maciver; Isobel	Dallas	TX	N/A	N/A

US-CL-CURRENT: 435/69.1; 424/234.1, 424/251.1, 435/252.2, 435/320.1, 435/69.3,
536/23.1, 536/23.7, 536/24.32

Full	Title	Citation	Front	Review	Classification	Date	Reference
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KWIC	Draw Desc	Image
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☐ 16. Document ID: US 5981503 A

L7: Entry 16 of 30

File: USPT

Nov 9, 1999

US-PAT-NO: 5981503
DOCUMENT-IDENTIFIER: US 5981503 A

TITLE: Analog of Haemophilus Hin47 with reduced protease activity

DATE-ISSUED: November 9, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Loosmore; Sheena M.	Aurora	N/A	N/A	CAX
Yang; Yan-Ping	Willowdale	N/A	N/A	CAX
Chong; Pele	Richmond Hill	N/A	N/A	CAX
Oomen; Raymond P.	Schomberg	N/A	N/A	CAX
Klein; Michel H.	Willowdale	N/A	N/A	CAX

US-CL-CURRENT: 514/44; 536/23.7

Full	Title	Citation	Front	Review	Classification	Date	Reference
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KWIC	Draw Desc	Image
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☐ 17. Document ID: US 5977337 A

L7: Entry 17 of 30

File: USPT

Nov 2, 1999

US-PAT-NO: 5977337

DOCUMENT-IDENTIFIER: US 5977337 A

TITLE: Lactoferrin receptor genes of Moraxella

DATE-ISSUED: November 2, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Loosmore; Sheena M.	Aurora	N/A	N/A	CAX
Du; Run-Pan	Thornhill	N/A	N/A	CAX
Wang; Quijun	Thornhill	N/A	N/A	CAX
Yang; Yan-Ping	Willowdale	N/A	N/A	CAX
Klein; Michel H.	Willowdale	N/A	N/A	CAX

US-CL-CURRENT: 536/23.7; 424/256.1, 435/69.1, 435/69.3, 435/69.4, 530/350, 536/23.1,
536/24.3, 536/24.32

Full	Title	Citation	Front	Review	Classification	Date	Reference
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KWIC	Draw Desc	Image
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☐ 18. Document ID: US 5962430 A

L7: Entry 18 of 30

File: USPT

Oct 5, 1999

US-PAT-NO: 5962430

DOCUMENT-IDENTIFIER: US 5962430 A

TITLE: Analog of Haemophilus Hin47 with reduced protease activity

DATE-ISSUED: October 5, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Loosmore; Sheena M.	Aurora, Ontario	N/A	N/A	CAX
Yang; Yan-Ping	Willowdale, Ontario	N/A	N/A	CAX
Chong; Pele	Richmond Hill, Ontario	N/A	N/A	CAX
Oomen; Raymond P.	Schomberg, Ontario	N/A	N/A	CAX
Klein; Michel H.	Willowdale, Ontario	N/A	N/A	CAX

US-CL-CURRENT: 514/44; 424/256.1

Full	Title	Citation	Front	Review	Classification	Date	Reference
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KWIC	Draw Desc	Image
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☐ 19. Document ID: US 5939297 A

L7: Entry 19 of 30

File: USPT

Aug 17, 1999

US-PAT-NO: 5939297

DOCUMENT-IDENTIFIER: US 5939297 A

TITLE: Analog of haemophilus HIN47 with reduced protease activity

DATE-ISSUED: August 17, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Loosmore; Sheena M.	Aurora	N/A	N/A	CAX
Yang; Yan-Ping	Willowdale	N/A	N/A	CAX
Chong; Pele	Richmond Hill	N/A	N/A	CAX
Oomen; Raymond P.	Schomberg	N/A	N/A	CAX
Klein; Michel H.	Willowdale	N/A	N/A	CAX

US-CL-CURRENT: 435/220, 435/252.3, 435/320.1, 435/325, 435/419, 435/476, 435/69.3,
536/23.2, 536/23.7

Full	Title	Citation	Front	Review	Classification	Date	Reference
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KWIC	Draw Desc	Image
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☐ 20. Document ID: US 5935573 A

L7: Entry 20 of 30

File: USPT

Aug 10, 1999

US-PAT-NO: 5935573

DOCUMENT-IDENTIFIER: US 5935573 A

TITLE: Method of use of an analog of Haemophilus influenzae Hin47 with reduced protease activity

DATE-ISSUED: August 10, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Loosmore; Sheena M.	Aurora	N/A	N/A	CAX
Yang; Yan-Ping	Willowdale	N/A	N/A	CAX
Chong; Pele	Richmond Hill	N/A	N/A	CAX
Oomen; Raymond P.	Schomberg	N/A	N/A	CAX
Klein; Michel H.	Willowdale	N/A	N/A	CAX

US-CL-CURRENT: 424/94.63; 424/94.64, 435/220, 514/12, 514/2

Full	Title	Citation	Front	Review	Classification	Date	Reference
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KWIC	Draw Desc	Image
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L10: Entry 22 of 27

File: USPT

Jun 2, 1998

US-PAT-NO: 5759813

DOCUMENT-IDENTIFIER: US 5759813 A

TITLE: Methods and compositions relating to useful antigens of Moraxella catarrhalis

DATE-ISSUED: June 2, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Hansen; Eric J.	Plano	TX	N/A	N/A
Maciver; Isobel	Dallas	TX	N/A	N/A
Helminen; Merja	Helsinki	N/A	N/A	FIN

US-CL-CURRENT: 435/69.3; 424/184.1, 435/320.1, 435/325, 435/69.1, 530/350, 536/23.1, 536/23.7

CLAIMS:

We claim:

1. A process for preparing an Moraxella catarrhalis antigen composition comprising the steps of:
 - a) selecting cells capable of expressing a Moraxella catarrhalis protein or peptide antigen wherein said protein or peptide antigen has an epitope that is immunologically reactive with monoclonal antibody 17C7 (ATCC HB 11093), 10F3 (ATCC HB 11092) or 8B6 (ATCC HB 11091);
 - b) culturing the cells under conditions effective to allow expression of the antigen; and
 - c) collecting the antigen to prepare the composition.
2. The process of claim 1, wherein the antigen is the 30 kD, 80 kD or high molecular weight outer membrane protein (HMW OMP) of Moraxella catarrhalis.
3. The process of claim 2, wherein the cells are recombinant host cells that express a recombinant DNA segment encoding the antigen.
4. The process of claim 3, wherein the recombinant cells are bacterial host cells.
5. The process of claim 4, wherein the bacterial host cells are Escherichia coli, Haemophilus influenzae, Salmonella sp., Mycobacterium sp., or Bacillus subtilis cells.
6. The process of claim 3, wherein the recombinant DNA segment encodes 30 kD, 80 kD or HMW OMP of M. catarrhalis, or a peptide antigen thereof.
7. A DNA segment encoding a protein or peptide antigen incorporating a Moraxella catarrhalis epitope that is immunologically reactive with monoclonal antibody 17C7 (ATCC HB 11093), 10F3 (ATCC HB 11092) or 8B6 (ATCC HB 11091).
8. The DNA segment of claim 7, further defined as encoding Moraxella catarrhalis 30 kD, 80 kD or high molecular weight outer membrane protein (HMW OMP).
9. The DNA segment of claim 7, wherein the peptide antigen is from 15 to 50 amino acids in length.
10. A recombinant vector incorporating a DNA segment of claim 7.
11. A recombinant host cell comprising the DNA segment of claim 7.
12. A host cell comprising the recombinant vector of claim 10.
13. The host cell of claim 12, wherein the host cell expresses the protein or peptide antigen.
14. The host cell of claim 13, further defined as expressing 30 kD, 80 kD or HMW OMP of Moraxella catarrhalis.

15. The host cell of claim 14, further defined as a bacterial host cell capable of overexpressing the 80 kD OMP in relation to Moraxella catarrhalis cells.

WEST☐ Generate Collection

L10: Entry 21 of 27

File: USPT

Sep 15, 1998

US-PAT-NO: 5808024

DOCUMENT-IDENTIFIER: US 5808024 A

TITLE: Nucleic acids encoding high molecular weight major outer membrane protein of moraxella

DATE-ISSUED: September 15, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Sasaki; Ken	Willowdale, Ontario	N/A	N/A	CAX
Harkness; Robin E.	Willowdale, Ontario	N/A	N/A	CAX
Loosmore; Sheena M.	Aurora, Ontario	N/A	N/A	CAX
Klein; Michel H.	Willowdale, Ontario	N/A	N/A	CAX

US-CL-CURRENT: 536/23.1; 424/251.1, 435/252.3, 435/320.1, 435/325, 435/69.1, 435/69.7, 530/300, 530/350, 536/23.5

CLAIMS:

What we claim is:

1. A purified and isolated nucleic acid molecule encoding an outer membrane protein of a strain of Moraxella having a molecular mass of about 200 kDa, as determined by SDS-PAGE, or an immunogenic fragment of the outer membrane protein containing any one of SEQ ID NOS: 1-3.
2. The nucleic acid molecule of claim 1, wherein the strain of Moraxella is a strain of Moraxella catarrhalis.
3. The nucleic acid molecule of claim 2, wherein the strain is Moraxella catarrhalis 4223.
4. The nucleic acid molecule of claim 1, wherein the encoded protein contains the amino acid sequence NH.sub.2
-Asn-Val-Lys-Ser-Val-Ile-Asn-Lys-Glu-Gln-Val-Asn-Asp-Ala-Asn-Lys-x-Gln-Gly -Ile (SEQ ID No: 2) for Moraxella catarrhalis strain 4223 or contains said amino acid sequence from other Moraxella strains.
5. A purified and isolated nucleic acid molecule having a nucleotide sequence selected from the group consisting of:
 - (a) the nucleotide sequence set out in FIGS. 6A to 6F (SEQ ID NO:1), or the complementary sequence thereto;
 - (b) a nucleotide sequence encoding a 200 kDa protein of a strain of Moraxella and containing the amino acid sequence NH.sub.2
-Asn-Val-Lys-Ser-Val-Ile-Asn-Lys-Glu-Gln-Val-Asn-Asp-Ala-Asn-Lys-x-Gln-Gly -Ile (SEQ ID NO:2), or the complementary sequence thereto; and
 - (c) a nucleotide sequence encoding a 200 kDa protein of a strain of Moraxella which hybridizes under highly stringent conditions to either of the complementary sequences defined in (a) or (b).
6. The nucleic acid molecule of claim 5, wherein the nucleotide sequence defined in (c) has at least about 90% sequence identity with any one of the sequences defined in (a) or (b).
7. A vector adapted for transformation of a host comprising a nucleic acid molecule having a nucleotide sequence selected from the group consisting of:
 - (a) the nucleotide sequence set out in FIGS. 6A to 6F (SEQ ID NO:1), or the

complementary sequence thereto;

(b) a nucleotide sequence encoding a 200 kDa protein of a strain of Moraxella and containing the amino acid sequence NH.sub.2

-Asn-Val-Lys-Ser-Val-Ile-Asn-Lys-Glu-Gln-Val-Asn-Asp-Ala-Asn-Lys-x-Gln-Gly -Ile (SEQ ID NO:2), and

(c) a nucleotide sequence encoding a 200 kDa protein of a strain of Moraxella which hybridizes under highly stringent conditions to either of the complementary sequences defined in (a) or (b).

8. An expression vector adapted for transformation of a host comprising a nucleic acid molecule having a nucleotide sequence selected from the group consisting of:

(a) the nucleotide sequence set out in FIGS. 6A to 6F (SEQ ID NO:1), or the complementary sequence thereto;

(b) a nucleotide sequence encoding a 200 kDa protein of a strain of Moraxella and containing the amino acid sequence NH.sub.2

-Asn-Val-Lys-Ser-Val-Ile-Asn-Lys-Glu-Gln-Val-Asn-Asp-Ala-Asn-Lys-x-Gln-Gly -Ile (SEQ ID NO:2), and

(c) a nucleotide sequence encoding a 200 kDa protein of a strain of Moraxella which hybridizes under highly stringent conditions to either of the complementary sequences defined in (a) or (b); and expression means operatively coupled to the nucleic acid molecule for expression by the host of an outer membrane protein of a strain of Moraxella having a molecular mass of about 200 kDa, as determined by SDS-PAGE.

9. The expression vector of claim 8, wherein the expression means includes a nucleic acid portion encoding a leader sequence for secretion from the host of the outer membrane protein or the fragment.

10. The expression vector of claim 8, wherein the expression means includes a nucleic acid portion encoding a lipidation signal for expression from the host of a lipidated form of the outer membrane protein.

11. A transformed host containing an expression vector as claimed in claim 8.

12. A live vector for delivery of an outer membrane protein of a strain of Moraxella having a molecular weight of about 200 kDa to a host, comprising a vector containing a nucleic acid molecule having a nucleotide sequence selected from the group consisting of:

(a) the nucleotide sequence set out in FIGS. 6A to 6F (SEQ ID NO:1), or the complementary sequence thereto;

(b) a nucleotide sequence encoding a 200 kDa protein of a strain of Moraxella and containing the amino acid sequence NH.sub.2

-Asn-Val-Lys-Ser-Val-Ile-Asn-Lys-Glu-Gln-Val-Asn-Asp-Ala-Asn-Lys-x-Gln-Gly -Ile (SEQ ID NO:2), and

(c) a nucleotide sequence encoding a 200 kDa protein of a strain of Moraxella which hybridizes under highly stringent conditions to either of the complementary sequences defined in (a) or (b).

13. The live vector of claim 12, wherein the vector is selected from the group consisting of *E. coli*, *Salmonella*, BCG, adenovirus, poxvirus, vaccinia and poliovirus.

WEST☐ Generate Collection

L10: Entry 16 of 27

File: USPT

Nov 2, 1999

US-PAT-NO: 5977337

DOCUMENT-IDENTIFIER: US 5977337 A

TITLE: Lactoferrin receptor genes of Moraxella

DATE-ISSUED: November 2, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Loosmore; Sheena M.	Aurora	N/A	N/A	CAX
Du; Run-Pan	Thornhill	N/A	N/A	CAX
Wang; Quijun	Thornhill	N/A	N/A	CAX
Yang; Yan-Ping	Willowdale	N/A	N/A	CAX
Klein; Michel H.	Willowdale	N/A	N/A	CAX

US-CL-CURRENT: 536/23.7; 424/256.1, 435/69.1, 435/69.3, 435/69.4, 530/350, 536/23.1, 536/24.3, 536/24.32

CLAIMS:

What we claim is:

1. A purified and isolated nucleic acid molecule encoding at least one lactoferrin binding protein of Moraxella and having a restriction map as shown in FIG. 3 for M. catarrhalis strain 4223 or a restriction map as shown in FIG. 5 for M. catarrhalis strain Q8.
2. A purified and isolated nucleic acid molecule which encodes a lactoferrin receptor protein and having a DNA sequence selected from the group consisting of:
 - (a) a DNA sequence as set forth in SEQ ID Nos. 1, 2, 3, 4, 5, 6, 7, 8, 9, and 10 or the fully complementary DNA sequence thereto;
 - (b) a DNA sequence encoding an amino acid sequence as set forth in SEQ ID Nos. 11, 12, 13, 14, 15, 16, 17, and 18 or the fully complementary DNA sequence thereto; and
 - (c) a DNA sequence which encodes a lactoferrin receptor protein of a strain of Morexella and which hybridizes under stringent conditions to any one of the DNA sequences defined in (a) or (b).
3. A vector adapted for transformation of a host comprising the nucleic acid molecule of claim 2.
4. The vector of claim 3 encoding a lactoferrin receptor protein and having the characteristics of a plasmid selected from the group consisting of pLD3 as seen in FIG. 10, pLDW3 as seen in FIG. 10, pLD1-8 (ATCC 97,997) as seen in FIG. 12 and pLDW1 (ATCC 97998) as seen in FIG. 12.
5. The vector of claim 3 further comprising expression means operatively coupled to the nucleic acid molecule for expression of said lactoferrin receptor protein of a strain of Moraxella by the host containing the vector.
6. The vector of claim 5 having the characteristics of plasmid pRD1A as seen in FIG. 10, pRD1B as seen in FIG. 10, pQW1A as seen in FIG. 10, pQW1B as seen in FIG. 10, pRD2A as seen in FIG. 12, pRD2B as seen in FIG. 12, pQW2A as seen in FIG. 12, pQW2B as seen in FIG. 12, pLRD3 as seen in FIG. 13 and pLQW3 as seen in FIG. 13.
7. A transformed host containing an expression vector as claimed in claimed 5.

WEST☐ Generate Collection

L10: Entry 14 of 27

File: USPT

Nov 9, 1999

US-PAT-NO: 5981213

DOCUMENT-IDENTIFIER: US 5981213 A

TITLE: Methods and compositions relating to useful antigens of moraxella catarrhalis

DATE-ISSUED: November 9, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Hansen; Eric J.	Plano	TX	N/A	N/A
Helminen; Merja E.	Helsinki	N/A	N/A	FIN
Maciver; Isobel	Dallas	TX	N/A	N/A

US-CL-CURRENT: 435/69.1; 424/234.1, 424/251.1, 435/252.2, 435/320.1, 435/69.3,
536/23.1, 536/23.7, 536/24.32

CLAIMS:

What is claimed is:

1. A DNA segment, free from total genomic DNA, encoding a M catarrhalis 80 kD CopB outer membrane protein having the sequence of SEQ ID NO:4.
2. The DNA segment of claim 1, positioned under the control of a promoter.
3. The DNA segment of claim 2, positioned under the control of a recombinant promoter.
4. The DNA segment of claim 1, further defined as including an M. catarrhalis 80 kD CopB outer membrane protein-encoding nucleic acid sequence as set forth in SEQ ID NO:3.
5. A DNA segment encoding a peptide of about 15 to about 50 amino acids in length from SEQ ID NO:4.
6. The DNA segment of claim 5, wherein the encoded peptide is from about 15 to about 30 amino acids in length.
7. A nucleic acid segment which comprises at least a 30 nucleotide long stretch of SEQ ID NO:3.
8. The nucleic acid segment of claim 7, further defined as comprising at least a 50 nucleotide long stretch of SEQ ID NO:3.
9. The nucleic acid segment of claim 8, further defined as comprising at least a 100 nucleotide long stretch of SEQ ID NO:3.
10. The nucleic acid segment of claim 9, further defined as comprising at least a 2520 nucleotide long stretch of SEQ ID NO:3.
11. The nucleic acid segment of claim 10, further defined as having the nucleic acid sequence of SEQ ID NO:3.
12. The nucleic acid segment of claim 7, further defined as comprising a nucleic acid fragment of up to 3,000 basepairs in length.
13. The nucleic acid segment of claim 12, further defined as comprising a nucleic acid fragment of up to 1,000 basepairs in length.
14. The nucleic acid segment of claim 7, further defined as a DNA segment.
15. A recombinant vector incorporating a DNA segment of claim 1.
16. A recombinant host cell comprising a DNA segment of claim 1.
17. The recombinant host cell of claim 16, further defined as a bacterial host cell.
18. The recombinant host cell of claim 17, wherein the bacterial host cell is E. coli, H. influenzae, Salmonella, Mycobacterium or B. subtilis.
19. The recombinant host cell of claim 16, wherein the DNA segment is introduced into the cell by means of a recombinant vector.

20. The recombinant host cell of claim 19, wherein the host cell expresses the DNA segment to produce a protein or peptide antigen.
21. The recombinant host cell of claim 20, further defined as expressing the M. catarrhalis 80 kD CopB outer membrane protein.
22. The recombinant host cell of claim 21, further defined as overexpressing the M. catarrhalis 80 kD CopB outer membrane protein in relation to M. catarrhalis cells.
23. A method of using the DNA segment of claim 2, comprising:
 - (a) introducing a recombinant vector including said DNA segment into a recombinant host cell;
 - (b) culturing the recombinant host cell under conditions effective to allow expression of the encoded protein or peptide antigen; and
 - (c) collecting said expressed antigen.

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L10; Entry 13 of 27

File: USPT

Nov 30, 1999

US-PAT-NO: 5993826

DOCUMENT-IDENTIFIER: US 5993826 A

TITLE: Methods and compositions relating to useful antigens of moraxella catarrhalis

DATE-ISSUED: November 30, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Hansen; Eric J.	Plano	TX	N/A	N/A
Helminen; Meria E.	Helsinki	N/A	N/A	FIN
Maciver; Isobel	Dallas	TX	N/A	N/A

US-CL-CURRENT: 424/251.1; 424/184.1, 435/69.1, 435/69.3, 530/350, 530/388.1, 530/388.2

CLAIMS:

What is claimed is:

1. An antigen composition prepared according to a method comprising: introducing a recombinant expression vector including a DNA segment coding for the 80 kD copB antigen into a recombinant host cell; culturing the recombinant host cell under conditions effective to allow expression of the encoded 80 kD copB antigen; and collecting said expressed antigen.
2. A purified M. catarrhalis 80 kD CopB outer membrane protein.
3. A method for inducing an antibody response to M. catarrhalis 80 kD copB antigen in an animal, comprising administering to the animal an immunologically effective amount of purified M. catarrhalis 80 kD copB antigen.
4. The method of claim 3, wherein the M. catarrhalis 80 kD CopB outer membrane protein is a recombinant protein.
5. The method of claim 3 wherein an antigen composition is administered to the animal, the composition comprising purified M. catarrhalis outer membrane vesicles in combination with purified M. catarrhalis 80 kD CopB outer membrane protein.
6. The antigen of claim 2, further defined as recombinantly produced 80 kD copB antigen.
7. An antigen composition comprising purified 80 kD copB antigen, purified essentially free from other M. catarrhalis outer membrane antigens.
8. The antigen composition of claim 7, consisting essentially of the M. catarrhalis 80 kD copB outer membrane antigen.
9. The antigen composition of claim 7, wherein the M. catarrhalis 80 kD copB outer membrane antigen includes an amino acid-sequence consisting of that set forth in SEQ ID NO:2.
10. The antigen composition of claim 7, wherein the M. catarrhalis 80 kD copB outer membrane antigen is recombinantly produced.
11. The antigen composition of claim 7, wherein the composition comprises a pharmaceutically acceptable carrier or diluent.

WEST**End of Result Set**

Generate Collection

L8: Entry 2 of 2

File: USPT

Sep 15, 1998

US-PAT-NO: 5808024

DOCUMENT-IDENTIFIER: US 5808024 A

TITLE: Nucleic acids encoding high molecular weight major outer membrane protein of moraxella

DATE-ISSUED: September 15, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Sasaki; Ken	Willowdale, Ontario	N/A	N/A	CAX
Harkness; Robin E.	Willowdale, Ontario	N/A	N/A	CAX
Loosmore; Sheena M.	Aurora, Ontario	N/A	N/A	CAX
Klein; Michel H.	Willowdale, Ontario	N/A	N/A	CAX

US-CL-CURRENT: 536/23.1; 424/251.1, 435/252.3, 435/320.1, 435/325, 435/69.1, 435/69.7, 530/300, 530/350, 536/23.5

CLAIMS:

What we claim is:

1. A purified and isolated nucleic acid molecule encoding an outer membrane protein of a strain of Moraxella having a molecular mass of about 200 kDa, as determined by SDS-PAGE, or an immunogenic fragment of the outer membrane protein containing any one of SEQ ID NOS: 1-3.
2. The nucleic acid molecule of claim 1, wherein the strain of Moraxella is a strain of Moraxella catarrhalis.
3. The nucleic acid molecule of claim 2, wherein the strain is Moraxella catarrhalis 4223.
4. The nucleic acid molecule of claim 1, wherein the encoded protein contains the amino acid sequence NH.sub.2
-Asn-Val-Lys-Ser-Val-Ile-Asn-Lys-Glu-Gln-Val-Asn-Asp-Ala-Asn-Lys-x-Gln-Gly -Ile (SEQ ID No: 2) for Moraxella catarrhalis strain 4223 or contains said amino acid sequence from other Moraxella strains.
5. A purified and isolated nucleic acid molecule having a nucleotide sequence selected from the group consisting of:
(a) the nucleotide sequence set out in FIGS. 6A to 6F (SEQ ID NO:1), or the complementary sequence thereto;
(b) a nucleotide sequence encoding a 200 kDa protein of a strain of Moraxella and containing the amino acid sequence NH.sub.2
-Asn-Val-Lys-Ser-Val-Ile-Asn-Lys-Glu-Gln-Val-Asn-Asp-Ala-Asn-Lys-x-Gln-Gly -Ile (SEQ ID NO:2), or the complementary sequence thereto; and
(c) a nucleotide sequence encoding a 200 kDa protein of a strain of Moraxella which hybridizes under highly stringent conditions to either of the complementary sequences defined in (a) or (b).
6. The nucleic acid molecule of claim 5, wherein the nucleotide sequence defined in (c) has at least about 90% sequence identity with any one of the sequences defined in (a) or (b).
7. A vector adapted for transformation of a host comprising a nucleic acid molecule having a nucleotide sequence selected from the group consisting of:

- (a) the nucleotide sequence set out in FIGS. 6A to 6F (SEQ ID NO:1), or the complementary sequence thereto;
- (b) a nucleotide sequence encoding a 200 kDa protein of a strain of Moraxella and containing the amino acid sequence NH.sub.2
-Asn-Val-Lys-Ser-Val-Ile-Asn-Lys-Glu-Gln-Val-Asn-Asp-Ala-Asn-Lys-x-Gln-Gly -Ile (SEQ ID NO:2), and
- (c) a nucleotide sequence encoding a 200 kDa protein of a strain of Moraxella which hybridizes under highly stringent conditions to either of the complementary sequences defined in (a) or (b).
8. An expression vector adapted for transformation of a host comprising a nucleic acid molecule having a nucleotide sequence selected from the group consisting of:
- (a) the nucleotide sequence set out in FIGS. 6A to 6F (SEQ ID NO:1), or the complementary sequence thereto;
- (b) a nucleotide sequence encoding a 200 kDa protein of a strain of Moraxella and containing the amino acid sequence NH.sub.2
-Asn-Val-Lys-Ser-Val-Ile-Asn-Lys-Glu-Gln-Val-Asn-Asp-Ala-Asn-Lys-x-Gln-Gly -Ile (SEQ ID NO:2), and
- (c) a nucleotide sequence encoding a 200 kDa protein of a strain of Moraxella which hybridizes under highly stringent conditions to either of the complementary sequences defined in (a) or (b); and expression means operatively coupled to the nucleic acid molecule for expression by the host of an outer membrane protein of a strain of Moraxella having a molecular mass of about 200 kDa, as determined by SDS-PAGE.
9. The expression vector of claim 8, wherein the expression means includes a nucleic acid portion encoding a leader sequence for secretion from the host of the outer membrane protein or the fragment.
10. The expression vector of claim 8, wherein the expression means includes a nucleic acid portion encoding a lipidation signal for expression from the host of a lipidated form of the outer membrane protein.
11. A transformed host containing an expression vector as claimed in claim 8.
12. A live vector for delivery of an outer membrane protein of a strain of Moraxella having a molecular weight of about 200 kDa to a host, comprising a vector containing a nucleic acid molecule having a nucleotide sequence selected from the group consisting of:
- (a) the nucleotide sequence set out in FIGS. 6A to 6F (SEQ ID NO:1), or the complementary sequence thereto;
- (b) a nucleotide sequence encoding a 200 kDa protein of a strain of Moraxella and containing the amino acid sequence NH.sub.2
-Asn-Val-Lys-Ser-Val-Ile-Asn-Lys-Glu-Gln-Val-Asn-Asp-Ala-Asn-Lys-x-Gln-Gly -Ile (SEQ ID NO:2), and
- (c) a nucleotide sequence encoding a 200 kDa protein of a strain of Moraxella which hybridizes under highly stringent conditions to either of the complementary sequences defined in (a) or (b).
13. The live vector of claim 12, wherein the vector is selected from the group consisting of *E. coli*, *Salmonella*, BCG, adenovirus, poxvirus, vaccinia and poliovirus.

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L10: Entry 25 of 27

File: USPT

Feb 4, 1997

US-PAT-NO: 5599693

DOCUMENT-IDENTIFIER: US 5599693 A

TITLE: Methods and compositions relating to useful antigens of Moraxella catarrhalis

DATE-ISSUED: February 4, 1997

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Hansen; Eric J.	Plano	TX	N/A	N/A
Helminen; Merja	Dallas	TX	N/A	N/A
Maciver; Isobel	Dallas	TX	N/A	N/A

US-CL-CURRENT: 435/69.3; 424/184.1, 424/251.1, 435/243, 435/252.1, 435/7.2, 435/7.32, 435/71.1, 435/71.2, 436/543, 530/388.2, 530/388.4, 530/412, 530/413

CLAIMS:

What is claimed is:

1. A process for preparing an antigen composition, comprising the steps of:
 - (a) selecting cells expressing a Moraxella catarrhalis outer membrane protein or peptide antigen having an epitope that binds to a monoclonal antibody selected from the group consisting of 8B6 (ATCC HB 11091), 10F3 (ATCC HB 11092) and 17C7 (ATCC HB 11093);
 - (b) culturing said selected cells under conditions effective for expression of the antigen; and
 - (c) collecting the antigen to prepare the composition.
2. The process of claim 1, wherein the antigen comprises an M. Catarrhalis outer membrane antigen of about 30, 80 or 100 kD as determined by SDS-PAGE.
3. The process of claim 2, wherein the cells comprise M. catarrhalis cells.
4. The process of claim 2, wherein the cells comprise recombinant host cells that express a recombinant DNA segment encoding the antigen.
5. The process of claim 4, wherein the recombinant host cells comprise bacterial host cells.
6. The process of claim 5, wherein the bacterial host cells comprise E. coli, H. influenzae, Salmonella, Mycobacterium, or Bacillus subtilis cells.
7. The process of claim 4, wherein the recombinant DNA segment encodes an M. catarrhalis antigen that binds to a monoclonal antibody selected from the group consisting of 8B6 (ATCC HB 11091), 10F3 (ATCC HB 11092) and 17C7 (ATCC HB 11093).
8. The process of claim 1, further comprising purifying the antigen by a method that includes detergent extraction of outer membrane vesicles of M. catarrhalis.
9. The process of claim 1, wherein the antigen binds to the monoclonal antibody 8B6 (ATCC HB 11091).
10. The process of claim 1, wherein the antigen binds to the monoclonal antibody 10F3 (ATCC HB 11092).
11. The process of claim 1, wherein the antigen binds to the monoclonal antibody 17C7 (ATCC HB 11093).
12. The process of claim 1, wherein the antigen is purified to be essentially free from M. catarrhalis antigens other than those that bind to the monoclonal antibody selected from the group consisting of 8B6 (ATCC HB 11091), 10F3 (ATCC HB 11092) and 17C7 (ATCC HB 11093).

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L7: Entry 25 of 30

File: USPT

Jan 27, 1998

US-PAT-NO: 5712118

DOCUMENT-IDENTIFIER: US 5712118 A

TITLE: Vaccine for branhamella catarrhalis

DATE-ISSUED: January 27, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Murphy; Timothy F.	East Amherst	NY	N/A	N/A

US-CL-CURRENT: 435/69.3; 435/235.1, 435/252.1, 435/320.1, 435/91.1, 435/91.4, 530/350,
536/22.1, 536/23.1

CLAIMS:

What is claimed is:

1. A recombinant vector comprising a DNA sequence encoding one or more antigenic epitopes of CD, wherein CD is an outer membrane protein of Branhamella catarrhalis having an apparent molecular mass determined by polyacrylamide gel electrophoresis of about 55,000 to 60,000 daltons and comprises an amino acid sequence shown in SEQ ID NO. 14.
2. The recombinant vector according to claim 1, wherein CD comprises an amino acid sequence of SEQ ID NO. 14 from amino acid residues 1 to 427.
3. The recombinant vector according to claim 1, wherein CD comprises an amino acid sequence of SEQ ID NO. 14 from amino acid residues -26 to 427.
4. The recombinant vector of claim 1, wherein the vector is selected from the group consisting of a plasmid vector, phagemid vector, cosmid vector, and a viral vector.
5. An isolated nucleic acid molecule selected from the group consisting of a gene depicted as a 1359 base pair open reading frame of SEQ ID No. 14, and a fragment of said gene, wherein said fragment encodes at least one epitope of outer membrane protein CD, wherein CD is an outer membrane protein of Branhamella catarrhalis having an apparent molecular mass of about 55,000 to 60,000 daltons determined by polyacrylamide gel electrophoresis and comprises an amino acid sequence shown in SEQ ID No. 14.
6. A recombinant microorganism containing the nucleic acid molecule of claim 5, and expresses a CD amino acid sequence selected from the group consisting of CD protein, CD peptides and CD oligopeptides, wherein CD is an outer membrane protein of Branhamella catarrhalis having an apparent molecular mass of about 55,000 to 60,000 daltons determined by polyacrylamide gel electrophoresis and comprises an amino acid sequence shown in SEQ ID NO. 14.
7. A microorganism of claim 6, which is a vaccinia virus, adenovirus, or cytomegalovirus.
8. A microorganism of claim 6, which is a bacterium of the genus Salmonella.
9. A method for producing a purified peptide, oligopeptide or protein having one or more antigenic epitopes of CD, wherein CD is an outer membrane protein of Branhamella catarrhalis comprising an amino acid sequence of SEQ ID NO.14, said method comprises (a) growing in culture the recombinant microorganism according to claim 6; and (b) isolating said peptide, oligopeptide, or protein having one or more antigenic epitopes of CD from the cultured recombinant microorganism or from medium used for culture.

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L7: Entry 28 of 30

File: USPT

Feb 4, 1997

US-PAT-NO: 5599693

DOCUMENT-IDENTIFIER: US 5599693 A

TITLE: Methods and compositions relating to useful antigens of moraxella catarrhalis

DATE-ISSUED: February 4, 1997

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Hansen; Eric J.	Plano	TX	N/A	N/A
Helminen; Merja	Dallas	TX	N/A	N/A
Maciver; Isobel	Dallas	TX	N/A	N/A

US-CL-CURRENT: 435/69.3; 424/184.1, 424/251.1, 435/243, 435/252.1, 435/7.2, 435/7.32, 435/71.1, 435/71.2, 436/543, 530/388.2, 530/388.4, 530/412, 530/413

CLAIMS:

What is claimed is:

1. A process for preparing an antigen composition, comprising the steps of:
 - (a) selecting cells expressing a Moraxella catarrhalis outer membrane protein or peptide antigen having an epitope that binds to a monoclonal antibody selected from the group consisting of 8B6 (ATCC HB 11091), 10F3 (ATCC HB 11092) and 17C7 (ATCC HB 11093);
 - (b) culturing said selected cells under conditions effective for expression of the antigen; and
 - (c) collecting the antigen to prepare the composition.
2. The process of claim 1, wherein the antigen comprises an M. Catarrhalis outer membrane antigen of about 30, 80 or 100 kD as determined by SDS-PAGE.
3. The process of claim 2, wherein the cells comprise M. catarrhalis cells.
4. The process of claim 2, wherein the cells comprise recombinant host cells that express a recombinant DNA segment encoding the antigen.
5. The process of claim 4, wherein the recombinant host cells comprise bacterial host cells.
6. The process of claim 5, wherein the bacterial host cells comprise E. coli, H. influenzae, Salmonella, Mycobacterium, or Bacillus subtilis cells.
7. The process of claim 4, wherein the recombinant DNA segment encodes an M. catarrhalis antigen that binds to a monoclonal antibody selected from the group consisting of 8B6 (ATCC HB 11091), 10F3 (ATCC HB 11092) and 17C7 (ATCC HB 11093).
8. The process of claim 1, further comprising purifying the antigen by a method that includes detergent extraction of outer membrane vesicles of M. catarrhalis.
9. The process of claim 1, wherein the antigen binds to the monoclonal antibody 8B6 (ATCC HB 11091).
10. The process of claim 1, wherein the antigen binds to the monoclonal antibody 10F3 (ATCC HB 11092).
11. The process of claim 1, wherein the antigen binds to the monoclonal antibody 17C7 (ATCC HB 11093).
12. The process of claim 1, wherein the antigen is purified to be essentially free from M. catarrhalis antigens other than those that bind to the monoclonal antibody selected from the group consisting of 8B6 (ATCC HB 11091), 10F3 (ATCC HB 11092) and 17C7 (ATCC HB 11093).

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L7: Entry 24 of 30

File: USPT

Mar 10, 1998

US-PAT-NO: 5725862

DOCUMENT-IDENTIFIER: US 5725862 A

TITLE: Vaccine for branhamella catarrhalis

DATE-ISSUED: March 10, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Murphy; Timothy F.	East Amherst	NY	N/A	N/A

US-CL-CURRENT: 424/251.1; 424/184.1, 424/185.1, 424/234.1, 435/252.3, 435/254.11,
435/320.1, 435/69.1, 435/70.1, 435/71.1, 514/2, 530/300, 530/350

CLAIMS:

What is claimed is:

1. A vaccine formulation comprising

(a) an immunologically effective amount of CD protein, wherein CD is an isolated and purified outer membrane protein of Branhamella catarrhalis of an apparent molecular mass of from 55,000 to 60,000 daltons by SDS-PAGE and which is encoded by a nucleotide sequence shown as an open reading frame in SEQ ID NO. 14; and

(b) a physiological carrier.

2. The vaccine formulation according to claim 1, wherein the CD protein comprises the amino acid sequence from amino acid residue 1 to amino acid residue 427 of SEQ ID NO. 14.3. The vaccine formulation according to claim 1, wherein the CD protein comprises the amino acid sequence from amino acid residue -26 to amino acid 427 of SEQ ID NO. 14.4. The vaccine formulation according to claim 1, wherein the protein was produced recombinantly from cells cultured from a host cell system genetically engineered to include a vector containing a nucleotide sequence that regulates expression of DNA sequences encoding CD epitopes, said host cell system is selected from the group consisting of bacteria, yeast, filamentous fungi, insect cell lines, and mammalian cell lines.5. The vaccine formulation according to claim 1, further comprising an immune modulator.

6. An antigenic composition comprising (a) an antigenically effective amount of a peptide or oligopeptide of CD outer membrane and protein of Branhamella catarrhalis, wherein the peptide or oligopeptide has one or more CD epitopes selected from the group consisting of SEQ ID NO. 1, SEQ ID NO. 19, SEQ ID NO. 22, SEQ ID NO. 25, SEQ ID NO. 28, SEQ ID NO. 31, SEQ ID NO. 33, SEQ ID NO. 36, SEQ ID NO. 38, SEQ ID NO. 41, SEQ ID NO. 44, SEQ ID NO. 47, and SEQ ID NO. 50; and (b) a physiological carrier.

7. The vaccine formulation according to claim 4, wherein the nucleotide sequence encoding CD epitopes is selected from the group consisting of SEQ ID NO. 1 and SEQ ID NO. 14.8. The vaccine formulation according to claim 4, in which the host cell system is a bacterium.9. The vaccine formulation according to claim 4, in which the host cell system is a yeast.10. The vaccine formulation according to claim 4, in which the host cell system is a filamentous fungus.11. The vaccine formulation according to claim 4, in which the host cell system is an

insect cell line.

12. The vaccine formulation according to claim 4, in which the host cell system is a mammalian cell line.

13. A CD peptide, CD oligopeptide, or CD protein, wherein CD is an isolated and purified outer membrane protein of *Branhamella catarrhalis* of an apparent molecular mass of from 55,600 to 60,000 daltons by SDS-PAGE and having an amino acid sequence comprising SEQ ID NO. 14.

14. The CD protein according to claim 13, wherein the protein comprises amino acid residue 1 to amino acid 427 of SEQ ID NO. 14.

15. The CD protein according to claim 13, wherein the protein comprises amino acid residue -26 to amino acid residue 427 of SEQ ID NO. 14.

16. The peptide or oligopeptide according to claim 13, wherein the peptide or oligopeptide is selected from the group consisting of SEQ ID NO. 1, SEQ ID NO. 19, SEQ ID NO. 22, SEQ ID NO. 25, SEQ ID NO. 28, SEQ ID NO. 31, SEQ ID NO. 33, SEQ ID NO. 36, SEQ ID NO. 38, SEQ ID NO. 41, SEQ ID NO. 44, SEQ ID NO. 47, and SEQ ID NO. 50.

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L10: Entry 23 of 27

File: USPT

Sep 9, 1997

US-PAT-NO: 5665353
DOCUMENT-IDENTIFIER: US 5665353 A

TITLE: Composition containing an analog of haemophilus Hin47 with reduced protease activity

DATE-ISSUED: September 9, 1997

INVENTOR-INFORMATION:

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US-CL-CURRENT: 424/94.63; 424/94.64, 435/220, 514/12, 514/2

CLAIMS:

What we claim is:

1. An immunogenic composition, comprising, as an active component thereof an immuno-effective amount of an isolated and purified analog of Haemophilus influenzae Hin47 protein having a decreased protease activity which is less than about 10% of that of natural Hin47 protein, wherein at least one amino acid of the natural Hin47 protein contributing to protease activity and which is selected from the group consisting of amino acids 91, 121 and 195 to 201 of natural Hin47 protein has been deleted or replaced by a different amino acid to provide said reduced protease activity.
2. The immunogenic composition of claim 1 formulated as a vaccine for in vivo administration to a host to confer protection against diseases caused by a bacterial pathogen that produces Hin47 protein or a protein capable of inducing antibodies in the host specifically reactive with Hin47 protein.
3. The immunogenic composition of claim 2 wherein the bacterial pathogen is a Haemophilus species.
4. The immunogenic composition of claim 3 wherein the Haemophilus species is Haemophilus influenzae.
5. The immunogenic composition of claim 2 further comprising at least one other immunogenic or immunostimulating material.
6. The immunogenic composition of claim 4 wherein the at least one other material is an adjuvant.

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L7: Entry 29 of 30

File: USPT

Sep 3, 1996

US-PAT-NO: 5552146

DOCUMENT-IDENTIFIER: US 5552146 A

TITLE: Methods and compositions relating to useful antigens of Moraxella catarrhalis

DATE-ISSUED: September 3, 1996

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Hansen; Eric J.	Plano	TX	N/A	N/A
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US-CL-CURRENT: 424/251.1; 424/184.1, 530/350

CLAIMS:

What is claimed is:

1. An antigen composition comprising an Moraxella catarrhalis outer membrane antigen selected from the group consisting of M. catarrhalis outer membrane antigens immunologically reactive with monoclonal antibody 10F3 (ATCC HB 11092) or 17C7 (ATCC 11093), wherein said antigen is purified free of other M. catarrhalis outer membrane antigens.
2. The composition of claim 1, wherein the selected M. catarrhalis antigen is immunologically reactive with monoclonal antibody 10F3 (ATCC HB 11092).
3. The composition of claim 1, wherein the selected M. catarrhalis antigen is immunologically reactive with monoclonal antibody 17C7 (ATCC HB 11093).
4. The composition of claim 1, wherein the M. catarrhalis antigen is prepared by recombinant means.
5. The composition of claim 1, further defined as being essentially free of M. catarrhalis antigens other than those reactive with monoclonal antibody 10F3 or 17C7.
6. The composition of claim 1, wherein the antigen is comprised in a pharmaceutically acceptable buffer.
7. The composition of claim 6, wherein the pharmaceutically acceptable buffer includes an acceptable carrier or adjuvant.